permutations of protein, pressure, and cells. But along these lines the fluid from cases of tuberculous meningitis is characteristic, as compared with that from cases of paresis or of cerebrospinal syphilis, and these also differ from the normal fluid. If a case be suspected to be one of tuberculous meningitis, but the fluid prove to be normal as regards pressure, protein, and cells, the disease may be ruled out. This rule probably holds absolutely, but it is desirable that more cases be studied before the statement is too strongly made.

5. The "clear elements," "cellular degenerations," "pseudo-endothelial cells," often noted, are definitely proved to be degenerated cells.

Most of the cases studied were from Dr. Barker's wards. My thanks are further due to him for the suggestion of this work, to Dr. Cushing for fluid from patients with hydrocephalus, and to Dr. R. I. Cole for much helpful advice during the work.

TROPICAL NEURASTHENIA AND ITS RELATION TO TROPICAL ACCLIMATION.

By Louis H. Fales, M.D.,
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It is strange that the nerve exhaustion of the tropics, which is so very prevalent among those who have sojourned for any considerable time in our island possessions, is scarcely mentioned by writers on tropical subjects. This form of nerve exhaustion, not so much on account of difference of symptoms from the usual manifestations of neurasthenia, but on account of its etiology, should receive the designation of tropical neurasthenia. The literature on the subject is very meagre. I cannot find mention of the disease by German, French, or English writers, and it is scarcely recognized by American authors.

Woodruff[1] states: "I have never seen any account of the terrible nervous exhaustion which results from long-continued exposure to great heat and moisture. It is a veritable neurasthenia. There is no escape from the heat, day or night. One wakes up at night drenched with perspiration. It wears out nervous force quickly and surely. Now the symptoms of exhaustion are everywhere. I never heard so many complaints of persistent insomnia as I did in the Philippines. One young, vigorous staff officer, who seemed always cool, complained to me one day that on the previous afternoon at five o'clock he found that he could not remember anything he read. When he got to the end of a sentence he had forgotten the beginning. He was completely disabled until the next morning. A surgeon informed me that before he was half through his rounds, he daily discovered that he could not remember the patients' answers, and he always had to lie down thirty to sixty minutes before the brain would again work properly. This general exhaustion, which is such a common occurrence as almost to merit the special term of tropical exhaustion, deserves the greatest attention. It reduces man's resistance to every disease, as his natural immunity is gone."

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[1] The Soldier in the Tropics. Phil. Med. Journ., April 7, 1900; Effects of Tropical Light on White Men.

I may quote the following, from an article by myself:[2] "The majority of American women who have resided for some length of time in the Philippines suffer with what we call tropical neurasthenia. They become nervous, irritable, anemic, lose weight, suffer with neuralgia, spells of faintness, sleep poorly, and almost invariably are troubled with menorrhagia and dysmenorrhœa." In a later monograph Woodruff again refers to the neurasthenia of white men in the tropics. Indeed, the object of his monograph is to prove that these tropical exhaustions are caused by the actinic or short waves of light which are of greater intensity in the tropics. Outside the above I have been unable to find anything of importance in literature relating to tropical neurasthenia—a disease, I believe, that is not only very prevalent in the Philippines, but is also an important factor in preventing acclimation of white men in the tropics and will prevent the successful colonization of the Philippines by Americans.

If we search for the true cause of the invalidism of so many public servants in the Insular service we find that a large percentage of the 50 per cent. (as stated by Musgrave[3] as due to intestinal amœbiases) had been suffering for some time with tropical neurasthenia which had destroyed their natural immunity and made them very susceptible to amœbic infection. From experience in private practice and government service, I can say that nearly all American women and a large proportion of men who have been in the Islands one year or more suffer, at least to some extent, with nerve exhaustion. It is conservative to state that 50 per cent. of the women and 30 per cent. of the men suffer with neurasthenia to such an extent that they are in a state of semi-invalidism. These persons cannot easily concentrate their minds on their work, they suffer with loss of memory, they become easily fatigued, and they cannot do the efficient work they were formerly capable of doing. There is no doubt that directly and indirectly tropical neurasthenia incapacitates more white men in the Philippines than all other causes combined and seems to be the main hindrance to the ability of white people to become acclimated in the tropics.

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[2] The American Physician in the Philippine Civil Service. Amer. Med., April 1, 1905.

[3] Treatment of Intestinal Amœbiasis in the Tropics, Bulletin No. 18, Bureau of Government Laboratories, Manila, 1904.

SYMPTOMS. The symptoms of the nerve exhaustion of the tropics are not unlike neurasthenia, as seen in America. There are, however, a few minor differences which I shall consider.

1. In regard to women, menstrual derangements, metrorrhagia, menorrhagia, and dysmenorrhœa are much more prevalent in the Philippines as an accompaniment of neurasthenia than in this country. It is safe to say that ninety-five out of every hundred women who suffer with neurasthenia suffer with these menstrual troubles, and the majority of these to a very marked degree. These menstrual disorders are not unknown in this country. Brower has noticed them in about 20 per cent. of neurasthenic women who have come under his notice, but they were not marked. Richard Dewey has noticed a few severe cases in neurasthenics, but believes that neurasthenia did not cause, but only aggravated, the disorder. Whether these menstrual disorders are caused by relaxation due to excessive heat and a moist climate, or to some derangement in the vasomotor mechanism due to the neurasthenic condition, is still open to question. It is probable, however, that both influences work together to produce the condition.

2. Vasomotor symptoms seem to be somewhat more prominent in tropical neurasthenia. Among the most important of these are angioneurotic œdema, which Quincke regards as a vasomotor neurosis under the influence of which the permeability of vessels is suddenly increased. Pemphigus, which is generally known to accompany changes in trophic nerves, is also quite prevalent. Localized sweating, œdemas, etc., are quite common.

3. Tropical neurasthenia responds more readily to treatment than ordinary neurasthenia. Change of climate is especially effective. Many subjects leave Manila in a most exhausted condition, but after a short stay in Japan, or a voyage across the Pacific, their condition is remarkably improved.

ETIOLOGY. As regards the etiology of tropical neurasthenia—it differs from that of the neurasthenia of this country. Overwork, worry, heredity, abuse of alcohol, certain infectious diseases, etc., predispose to tropical neurasthenia, as in America, but they do not seem to be the main causes. The etiology of tropical neurasthenia may be discussed under the following heads: (1) Manner of living; (2) the effect of certain infectious diseases, such as dengue fever, dysentery, etc.; (3) the effect of the excessive use of alcohol; (4) the effect of the rays of the sun; and (5) the effect of continuous and excessive moist heat.

1. Many Americans, on reaching the Philippines, attempt to continue the same active life that they are accustomed to in the United States. They attempt to work the same number of hours, they go out in the sun without protection, and they take no midday

siesta. When going to a new country, it is always a good plan to study the prevailing customs and not try to follow one's old mode of living under different conditions. The native Philippino works fewer hours than we do. He is careful to protect himself from the hot sun, and he invariably sleeps from 12 to 3 in the afternoon. If Americans persist in disregarding the customs of the country, and try to continue their accustomed activity, they may expect an early nervous breakdown.

2. Certain infectious diseases prevalent in the Philippines predispose to nerve exhaustion. The most important of these are dengue fever and amœbic dysentery. During certain seasons of the year dengue fever is epidemic and attacks a large proportion of the population. The ensuing prostration is often extreme and usually continues long after the disappearance of the fever. In many people an attack of dengue fever is the beginning of their neurasthenic condition. Amœbic dysentery, if long continued, is very exhausting and predisposes to or increases the neurasthenia.

3. There is great difference of opinion in regard to the effect of alcohol in the tropics. Woodruff states that "statistics of about 2800 soldiers show that the damage done to these vigorous men by the small amount of excessive drinking they indulged in was not so great as the damage done by the climate to the total abstainers. Approximately, 11 per cent. of the abstainers died, while about 3.5 per cent of the moderate drinkers, and less than 2 per cent. of the excessive drinkers died. About 15 per cent. of abstainers were invalided home, about 9 per cent. of the moderate drinkers, and about 8 per cent. of the excessive drinkers." Other observers give a directly opposite opinion—that nowhere are the effects of alcohol so detrimental as in the tropics. Some writers state that the excessive use of alcohol is one of the main factors serving to prevent the colonization of the tropics by white men. I have not been able to make systematic observations of this subject and must leave the question open to farther investigation. It is possible, however, that the moderate use of alcohol may serve to prevent intestinal infection by certain parasites, (1) by stimulating the action of the gastric juice, and (2) by its antiseptic action on the parasites themselves.

4. The actinic theory of the cause of neurasthenia in the tropics, promulgated by Major Woodruff,[4] demands special attention. This work originated as stated in the preface "in an attempt to prove or disprove the theory announced by von Schmädel, in a paper read before the Anthropological Society of Munich, in 1895, that skin pigmentation of man was evolved for the purpose of excluding the dangerous actinic or short rays of light which destroy living protoplasm." The argument runs as follows:

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[4] Effects of Tropical Light on White Men.

The actinic rays of the spectrum, also called ultra-violet or photographic rays, which are invisible rays of very short wave length, are known to cause great damage to living protoplasm. Man also suffers from the effect of these rays if he is so situated that the rays are strong enough to penetrate the skin and exert their chemical effects on the tissues. It is the pigment in the skin which ordinarily protects man from the dangerous effects of these rays. The amount of pigment in each individual is in direct proportion to the intensity of the light of the country to which his ancestors have proved their adjustment by centuries of survival in health and vigor. If, therefore, man remains in the environment to which he has become accustomed for thousands of years, his pigmentation is sufficient to prevent the penetration of the ultra-violet or actinic rays. As we go south, the light becomes more intense, first, because the amount of light per unit of surface increases, and, second, as we go nearer the equator the layer of air which the rays must pass through is thinner and fewer rays are absorbed. The inhabitants of the tropics, therefore, in order to counteract these increased actinic rays have, after many centuries, developed more pigment in their skin than northern races. The white man in going to a tropical country like the Philippines leaves the environment where perhaps his ancestors have resided for centuries, and exposes himself to actinic rays which penetrate the skin (it being insufficiently pigmented) and exerts certain chemical action on the tissues which is responsible for the neurasthenia as seen in the tropics.

Woodruff has noticed that brunette types do better in the Philippines than blondes. He even contends that the entire United States, with the exception of parts of Washington and Oregon, is too far south for blondes. City life in the United States on account of the glare is especially prejudicial to the health of blondes. He cites the fact that the Norwegians and Swedes coming from 60° and above to 45° and under, arrive here as vigorous men and women, but in a generation or two they degenerate into weak and neurasthenic men and women, many of whom succumb to tuberculosis. To prove his theory, Woodruff goes into the question very fully; actinic therapy is reviewed up to date. Many examples are given illustrating the effects of excessive light and the result of the migrations of blonde races is gone into from the earliest time until now. Just how the actinic rays on penetrating the skin bring about the state of nerve exhaustion is perhaps left a little indefinite, but overstimulation seems to be the view put forth.

Dr. James Weir, Jr., is quoted as follows: "Their action (the violet rays) must be, I take it, primarily through stimulation of the vasomotor nerves. The first effect is dynamic in character, there is a dilatation of the bloodvessels with a consequent flow of blood. The second effect is chemical in nature; the increased flow of blood incites the blood-producing organs to manufacture new blood cells.

There is also increased oxidation and oxygenation through the lungs. The third effect is purely physiological. Owing to the increased flow of new blood cells to the tissues, cell growth is excited and new tissue is formed." A little stimulation like the above is considered beneficial, but as the short rays become more intense, stimulation of metabolism is increased to such an extent that the functions become exhausted and a neurasthenic condition develops.

This theory, as presented by Major Woodruff, is very convincing, and, although the effect of the violet and ultra-violet rays may not play such an all-important part as he suggested, there can be no doubt that they play an important part in the etiology of tropical nerve exhaustion.

5. As regards the action of continuous moist heat in the production of neurasthenia, we know that excessive bodily heat is regulated mainly by the skin. The more blood that passes through the skin the greater the loss of heat by conduction, radiation, and evaporation. To accommodate a great flow of blood through the skin the arterioles of the skin must dilate. This may be produced in two ways: (1) Blood of a higher temperature than natural flowing over the vasomotor centres will stimulate the vasodilator fibers and cause the arterioles to dilate, and (2) warmth acting on the exterior of the body by stimulating sensory nerves will cause the skin arterioles reflexly to dilate. Sweating usually accompanies the increased blood flow through the skin, as the sweat centres in the spinal cord are stimulated either directly or reflexly in the same manner as the vasomotor centres.

The climate in the Philippines is such that during a greater portion of the time conditions are present which excite an increased flow of blood through the skin. These conditions are present nine months out of twelve and eighteen hours out of the twenty-four, and are dependent on the fact that in the Philippines there is a high temperature and a relatively high humidity. The reports of the Manila Weather Bureau covering a period of over twenty years show that the highest mean monthly maximum temperature is 96.98° F. in May, the lowest mean monthly maximum 89.78° F. in Decemer, with an average of 92.48° F., as the average mean maximum for the year. During the same period the highest mean monthly minimum is 72.86° F., also in May, and the lowest mean monthly minimum 64.22° F. in January, with an average of 69.08° F. as the average mean minimum for the year.

The temperature in Manila not only averages higher throughout the year than in our hottest summer months, but the relative humidity is considerably higher, as seen by the following table, in which the average temperature of three American cities for the three hottest months of the year, June, July, and August, is compared with the average temperature of Manila for the whole year and with the average temperature of the three coldest months in Manila, December, January, and February.

	Mean.	Mean max.	Mean min.	
Manila	80.42	92.48	69.08	Average temperature.
Manila	77.54	90.26	64.52	Three coldest months.
Chicago	68.1	74.9	61.8	Three hottest months.
Washington	73.1	84.2	63.3	Three hottest months.
New Orleans	82.1	91.4	75.4	Three hottest months.

The effect of the temperature is still more intensified by the fact that the relative humidity is very high in Manila.

The following table taken from the report of the chief of the Manila Weather Bureau conveys an idea of the relative humidity of certain cities in the United States as compared with Manila:

	Mean relative humidity.
Manila	79.4
Phœnix, Arizona	38.7
El Paso, Texas	38.8
Denver, Colorado	48.7
Pierre, S. D.	64.7
St. Louis	69.5
Philadelphia	70.3
St. Paul	71.9
Washington	72.3
New York	73.2
Milwaukee	74.9
Chicago	74.8
New Orleans	77.3
San Francisco	79.9
Block Island	81.2
Atlantic City	81.4

There are but few localities in the United States which surpass Manila in relative humidity. Even the locality of Milwaukee and Chicago, which is considered of high humidity, is surpassed by Manila nearly 5 per cent. The effects of such high temperature combined with the high percentage of humidity is well expressed by Prof. Dexter,[5] of the University of Illinois: "Excessive heat, together with great humidity, forms a most deadly combination for one not acclimated to it."

Stewart[6] states: "In a warm atmosphere the skin is flushed with blood, its vessels are dilated, its temperature is increased; an effort, so to speak, is being made by the organism to maintain the difference of temperature between its surface and its surroundings, on which the rate of heat loss by radiation and conduction depends. . . . In dry air the sweat evaporates freely and cools the skin, while in moist air, although according to Rubner, the loss of heat by radiation and conduction is increased, the loss of heat by evaporation of sweat is diminished in still greater degree. In saturated air at the body

[5] Weather-Influences.

[6] A Manual of Physiology.

temperature no loss of heat by perspiration or by evaporation from the pulmonary surface is possible."

Landois[7] states that a man is just able to work in an atmosphere at a temperature of 31° C., and almost completely saturated with watery vapor. Crombie states that Europeans in Bengal have an average of 0.41° more temperature than at home.

From these facts what must be the condition of the physical organism in the Philippines is apparent. The high temperature which is prevalent most of the time causes dilatation of the arteries of the skin with sweating. On account of the high relative humidity, evaporation from the skin is prevented to a considerable extent, often to such a degree that the organism is unable to keep the temperature down to normal. The resulting increased temperature of the blood still farther increases the dilatation of the arterioles of the skin and more blood flows through the skin to be cooled. This process is almost continuous, as seen by the excessive and almost constant perspiration which continues throughout the day and usually well into the morning hours.

The abnormal dilatation of the arterioles of the skin must cause a more or less marked anemia of the internal organs. There can be no doubt that such an anemia is produced. Kellogg[8] states that the muscles, the portal system, and the skin each is capable under certain conditions of retaining a large share of all the blood in the body, the skin by percussion, friction, reaction from cold and heat, especially the latter.

Signs of anemia of the central nervous system are observed very frequently in the Philippines. Vertigo and faintness are very prevalent phenomena, especially among women, and inability to remember and concentrate one's attention are often observed. Woodruff cites several instances of inability to think or remember without taking rest in the recumbent position. All such symptoms are most easily explained by the fact that the central nervous system is lacking in sufficient blood supply. The same cause may account for the gastric disorders that are so frequent. Granting, therefore, that a certain amount of anemia of the central nervous system exists, the question now presents itself, Is the anemia thus produced sufficient to cause, or to have some part in causing, the neurasthenia so characteristic of the tropics? I believe that such anemia is sufficient for the following reasons:

1. If temporary loss of memory can be induced by cerebral anemia it is reasonable to suppose that such anemia long continued may cause more or less permanent nervous derangement.

2. We know that if the various portions of the body are not supplied by a sufficient amount of blood they deteriorate or degenerate. The muscles grow small if they are not exercised sufficiently to cause

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[7] A Text-book of Human Physiology.

[8] Rational Hydrotherapy.

an increased flow of blood through them. If the laborer does not take sufficient rest after meals, a greater share of blood will remain in the muscles and digestive disturbances often follow because too little blood is allowed for the gastrointestinal digestion. Reasoning from analogy, is it not likely that the anemia of the central nervous system will cause a state of nervous exhaustion?

3. Several observers have noted that the nearer a white man approaches the size of the native, the better he seems able to resist the evil effects of a sojourn in the tropics. There are no statistics on record as to the size of men affected with neurasthenia, but from personal observation of those most markedly affected with nerve exhaustion, the large man seems to predominate.

The following quotation from a recent letter from Major Woodruff is much to the point: Speaking of neurasthenia, he says: "In my book I mention the facts that men of large musculature are more affected; since that was written I have learned of four new cases of these giants, all of whom have come back with dilated hearts and neurasthenia. In recent conversation with an Englishman from Ceylon, I learn that the big men break down, as a rule, and that the survivors who spend many years in India are, like Lord Roberts, the little fellows. I do not think there is any doubt that bigness makes one more susceptible, and that the nearer we approach the size of the native the better." The fact that large men are more susceptible to neurasthenia supports the anemia theory of tropical exhaustion.

Large men, especially those with large muscles, are more likely to suffer with anemia of the central system than smaller men, as is apparent from a calculation that I have made:

The area of the skin surface of a large man (six feet tall and weighing 175 pounds) was found to be 2677.6 cubic inches, and that of a small man (five feet, two inches tall weighing 114 pounds) 2272.8 cubic inches. In proportion to the weight of the two men, the skin surface of the large man was found to be 23 per cent. less than that of the small man. This deficiency of skin surface of nearly 25 per cent. makes it more difficult for these large men to cool off. In order to make up the deficiency more blood must be pumped through the skin or the cooling process must be kept up for a longer time. In either case it means an anemia of the central nervous system more pronounced than in men of smaller size and with a greater proportional skin surface. To force such an increased quantity of blood through the skin to be cooled, the heart is overworked. Hence, the extreme neurasthenia and cardiac dilatation seen in so many large men coming home from the Philippines.

This theory that the anemia of the central nervous system produced by excessive heat and humidity has some part in causing the neurasthenias of the tropics, has not been proved experimentally, but is presented as a plausible working hypothesis upon which may be based future study.

As regards acclimation, we cannot say that people are acclimated to a certain locality unless they can live there with comfort to themselves, their children, and their children's children. It does not follow, as some authors say, that because a certain proportion of the American people may live in the tropics with apparent comfort and good health for a certain time that acclimation is possible, and that it is possible for the white race to colonize in the tropics. After only a few years of residence in the tropics the white people become a race of neurasthenics. We know that neurasthenia is but a step toward degeneracy. What, therefore, will be the condition of the children of these people or of their grandchildren?

Born of neurasthenic parents, they will inherit an organism lacking in nerve force; being forced to live in an enervating climate, their small reserve will be still farther drawn upon, and in a generation or two there will result a race with little resemblance to the mother stock, small, puny, weak-minded, in fact a degenerate race which would soon cease to exist if new stock did not continually come from the home land.

PROPHYLAXIS AND TREATMENT. It is evident from what I have said that certain persons should avoid the tropics. These include blondes, large men with great musculature, those with tuberculous tendencies, those having disorders of the stomach and intestines, neurasthenics (including those suffering with headaches, insomnia, hysteria, insanity, etc.), women, children, and old men.

Many Americans contract pulmonary tuberculosis in the Philippines, and unless they change their climatic surroundings at once, they decline rapidly. The chances of contracting tuberculosis are greater than in America, in spite of the out-of-door life, because: (1) The natural resistance of the organism is greatly diminished, and (2) the disease is much more prevalent in the Islands.

In the United States, the yearly death-rate for pulmonary tuberculosis per 1000 inhabitants runs from 0.7 in the country districts, to 1.7 in some of our larger cities, while in Manila it is over 5.[9] The Philippine Civil Government has provided no hospital or sanatorium for the tuberculous sick, so that without treatment they are allowed at large, and infect the streets and their homes with their sputum.

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[9] A study of tuberculosis in the Bilibid Prison teaches a lesson as to the effect of overcrowding on this disease. This prison was originally intended for from 1000 to 1200 prisoners. In 1902 the number of prisoners averaged about 2000, and during that time the yearly death-rate from pulmonary tuberculosis per 1000 was 9.5. During the latter part of 1904 the number of prisoners was very much increased. For the twelve months ended October, 1905, the average was approximately 3900. During that year the yearly death-rate from tuberculosis per 1000 was over 52, or more than ten times the usual death-rate for that disease outside the prison. A moderate increase of pulmonary tuberculosis would be expected during confinement, but when during one year out of 3900 prisoners over 200 die of this disease something is radically wrong.

Nervous diseases are aggravated in the tropics. Insanity is much more prevalent in the Philippines than in America. In the report of the Surgeon General of the United States Army, for 1902,[10] we find that for the year ended June 3, 1901, the insanity rate among soldiers per 1000 for those at home was 1.38, while in the Philippines it was 2.79 for regulars and 3.9 for volunteers.

Old age, as well as childhood, contraindicates a sojourn in the tropics. Woodruff's statistics show that the best age is from twenty to thirty or thirty-five years. "No man over fifty-five should dare to go there except for a short visit."

Rules of tropical hygiene may be considered under the following heads: (1) The avoidance of the direct rays of the sun; (2) the avoidance of excessive heat; (3) food and its preparation; and (4) excessive labor and long hours.

1. The actinic rays may be avoided, to a certain extent, (1) by exposing one's self to the sun as little as possible; and (2) by employing proper protection and clothing. Panama hats and the Philippino straw hats afford inadequate protection for the head. When compelled to go in the sun, a black umbrella should be used, or better still, one should be provided with a broad-brimmed cork helmet which will not allow the actinic rays to penetrate.

The clothing is important. Materials should be used of sufficient opacity to prevent as much as possible the penetration of the actinic rays, but should be light enough so that the process of cooling off be not interfered with. Both theory and practice demonstrate that the outer garments should be white, since this color absorbs less heat than darker colors. The color which shows the greatest opacity to light rays is black. The underclothing, therefore, should be black and of a light material, preferably linen. During the cool evenings of the winter, flannel underclothing may be worn to prevent the too rapid cooling.

Major Woodruff calls attention to the unsuitability of the Philippine houses for Americans. Not enough provision is made to avoid the excessive light. The houses should be built with large, shady verandas, the roofs of which should slope well down, so that those sitting on the porch do not get the glare from the sky. The windows should be protected with awnings and there should be no iron roofs to reflect the heat and make the house no less than a furnace.

The midday siesta should not be forgotten. The avoidance of muscular activity for a few hours during the hottest portion of the day lessens excessive heat production; and the strong midday light rays are avoided.

2. To avoid excessive heat in the tropics is not always possible, but during the hottest months, May and June, it is advisable, indeed it is almost a necessity, that Americans sojourn in the cool regions

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[10] Report of Surgeon-General, U. S. Army, 1902.

of Japan or in Baguio, the summer capital in the mountains of Benguet.

3. The nervous exhaustion so prevalent demands the most nourishing of diets. It is a mistaken notion that dwellers in the tropics need little meat. More meat is needed than in our temperate climate. To avoid intestinal infection, all food must be aseptically prepared. Green vegetables of all kinds are dangerous, and it is doubtful if fruits even with thick coverings are safe. All water used for drinking purposes should be previously boiled, and while in a boiling state placed in retainers under lock and key until ready for use. Distilled water should not be considered safe, but should also be boiled, since a recent epidemic of amœbic dysentery in Manila was traced to an infected distilling plant.

If bottled water is used the brand must be selected with great care, as a great deal of the bottled water for sale in Manila is unreliable. The possibility of amœbic infection from ice washed with hydrant water and the rinsing of glasses in hydrant water without properly drying, must be borne in mind.

Americans must avoid excessive labor and long hours in the tropics. Manual labor in the sun is out of the question. Light manual labor in airy shops is less depressing, but should be limited to five hours daily. Mental work also is much more fatiguing than in America. Prolonged concentration of the mind is almost impossible. For the Philippine Civil Government to require more than five hours daily work by its employés means a less efficient service and an early breakdown. The statement made by some writers that American employés are able to do more work in the Philippines than at home is absurd in the extreme.

As regards treatment, early change of climate is usually all that is necessary. It is remarkable what a great change is produced in the patient's condition by a few months in Japan or a trip across the Pacific.

EXPERIMENTAL ARTERIAL DEGENERATION.

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The first successful experimental arterial degeneration should be credited to Lion and Gilbert,[1] who, in 1889, produced changes in the media by repeated intravenous injections of micro-organisms or their toxins. These changes were described as sclerocalcareous

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[1] Des séances de la Soc. de biol., October 12, 1889.